Form 936 H. C. Co. 140011 3-30

GENERAL RAILWAY SIGNAL CO., ROCHESTER, N. Y., U. S. A.

SIGNALS, TYPE "SA" AC COLOR LIGHT SIGNALS MECHANISMS SERVICE OPERATING AND TESTING VALUES CORRESPONDING TO VARIOUS AC VOLTAGE RATINGS
Supersedes E.D. 28718-1 dated 7-1-30

E.D. 28718-1

Cont'd Page 2, Page 1
File: 018.11 Signals, Color Lights Type SA

DATE	R-50349 9-10-30				
CHECKED	J.W.K.				
APPROVED BY ENG'R IN CHARGE					
APPROVED BY CHIEF ENG'R					

Mechanism Drawing Number	Frequency	Local Phase					Line Phase						
							Rated						
		Volts	Amps.	Watts	Turns	Series Resistor ohms	Volts	Amps.	Watts	Turns	Series Resistor ohms	Maximum Pick-Up	Minimum Full Release
53052-5, Gr 1-9	25	12.5	1.10	13.2	170	Lamp	15.	.4	2.88	648	---	12.5	6.2
53052-5 Gr 1-9	60	14.2	1.10	15.0	170	Lamp	16.5	.2	1.	648	---	13.5	6.7
53052-5 Gr 15-28	60	11.	1.54	6.5	200	---	110	.065	7.1	1600	1500	71	25
53052-5 Gr 29-42	25	12.5	1.07	13.2	220	Lamp	55	.140	4.65	---	---	36	14.5
53052-5 Gr.57-70	25	55	.271	13.8	1000	124	55	.140	4.65	2100	---	31	12.5
53052-5 Gr 15-28 Spl. per E.I.1249	50	9	1.57	6.25	200	---	110	.065	6.66	1600	1500	71	25
53052-5 Gr 43-56	50	110	.165	7.9	2100	---	110	.066	7.2	1600	1500 2 position	71 85	25 50

RECOMMENDED ST'D LAMPS FOR "SA" SIGNALS

Drawing No.	34866-25	34866-27	34866-32	34866-34			
Volts (1000 hrs)	13.5	5.4	11.3	9.0			
Watts (1000 hrs)	17	12.1	14.4	15.3			
Service Volts	10.5	5.	10.	8.			

SA SIGNAL CLEANING PROCEDURE	EI 2400 SHEET 1 OF 7 5276S

A. Cleaning Procedure

The following cleaning procedure must be performed on each SA Signal that is shopped. The procedure is to be performed in a clean area. During the cleaning procedure purging parts of foreign material is accomplished using air. Air is defined as approximately 90 psig, with water and oil trap, blown through a standard nozzle. Refer to Figure 1 for part reference number locations.

CAUTION: Because of the high air pressure being used, care must be exercised to avoid causing injury to self or others.

1. Remove the clear cover.

2. Tag and remove the six wires that are terminated at the contact and terminal block.

3. Remove the four screws that secure the mechanism to the die cast case. Remove the mechanism exercising care so that spectacle (reference 1) is not bent during removal.

4. Remove the magnets from the mechanism.

5. Remove and discard screws (reference 2) from front and back of mechanism. Keep ball (reference 5), shims (reference 6), bearing cap (reference 3) and bearing (reference 4), removed from front of mechanism, separate from like parts removed from rear of mechanism. These parts must be re-assembled in the same location from which they were removed.

6. Remove outside back bracket (reference 7) by removing the eight nuts from the four 6 inch long studs. This allows access to the two counterweight assemblies.

7. Remove and discard the locking wire from the counterweight pins. Remove and save the two pins that capture the counterweight links (reference 8).

8. Remove the copper braid lead from each counterweight. Label the counterweight assemblies so they will be re-assembled in the same position from which they were removed.

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DATE	9-14-87	REV		REV		REV		REV		REV		REV		REV		REV		REV		REV		REV	
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APP'D	GSA 9/14/87																						

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9. Remove the inside back bracket (reference 9). Remove the 4 spring washers.

10. Remove front bracket (reference 10).

11. Remove the two side pole pieces while supporting the armature assembly (reference A, with coil assembly).

12. Check armature assembly for damage.

NOTE: Do not disassemble armature assembly. If any damange is found to this assembly it must be rebalanced. It is recommended that this assembly be returned to GRS for repair and rebalancing. Improper balancing can result in a tendency to stay in other than the red position when de-energized.

13. If the armature assembly is undamaged, using air as previously specified:

    a. Purge blind holes (used for balancing) in bracket (reference 13) and wheel (reference 14) of any foreign material.

    b. Purge coil assembly of any foreign material.

    c. Purge "V" slot shafts (reference 15) of any foreign material.

14. Examine the two "V" slot grooves of shafts (reference 15) under at least seven times (7X) magnification to insure all foreign material has been removed. If additional foreign material is observed repeat step 13c. Lubricate "V" slot grooves with a very light film of oil, GRS drawing number 51347-14 Gr. 1. The recommended procedure is to soak a small piece of clean chamois in the specified oil. The chamois should then be wrung out until nearly dry and then used for oiling. Exercise care to avoid getting oil on any other part(s). No lubricant other than the one specified should be used. A new chamois should be used for each mechanism. Never resoak a used chamois in clean oil.

15. Examine the two counterweight posts (reference 18) that are part of inside back bracket (reference 9). If these posts exhibit any grooves or scratches they should be replaced. If parts are replaced new posts should be pressed into bracket such that 3/4 inch is left protruding. If posts do not need to be replaced they should be polished using the non-abrasive side of #400 sand paper.

16. Using the non-abrasive side of #400 sand paper polish the rounded ends of the top four (reference 16 and 17) and the bottom two armature stop screws.

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17. Check the two side pole pieces for corrosion. Any corrosion, in the area where the magnets or the magnet locking stud nuts contact the pole pieces, should be removed. Exercise care during cleaning to avoid damaging the plating on the pole pieces.

18. Using air purge side pole pieces and armature assembly of any foreign material.

19. Re-assemble the two side pole pieces onto the armature assemble. DO NOT FORCE!! Make sure circular projections on the sides of the front phenolic coil case fit into the hole in each side pole piece. Also check that the rectangular projections on the back phenolic coil case fit into the slotted opening in each pole piece.

20. Using air purge the magnet assembly and magnet locking stud and nuts of any foreign material.

21. Re-install the magnet assembly, the magnet ends stamped with "N" must be to the right side of the mechanism when it is viewed from the front. The ends stamped "N" must also be visible when the mechanism is viewed from the bottom. The bottom edge of the magnets should be flush with the bottom edge of the side pole pieces. The locking nuts must be seated properly in the holes in the side pole pieces and tightened properly.

22. Re-assemble the front armature supporting bracket (reference 10) after it has been purged of any foreign material with air.

23. Re-assemble the four wave washers on the four six inch studs. Wave of washer should be toward pole pieces.

24. Using air purge the inside back bracket (reference 9).

25. Re-assemble the inside back bracket (reference 9). Make sure four waved washers are on the shoulder of the four studs and not trapped on the threads of the studs.

26. Polish the pivot holes of the two counterweights using a 5/64 inch diameter wooden applicator stick. Two sources of these applicator sticks are VWR Scientific or Fischer Scientific. Using the non-abrasive side of #400 sand paper polish the top and bottom surfaces of both counterweights that contact the armature stop screws. Finally, using air purge both counterweights of any foreign material.

27. Re-install counterweights on the same side from which they were removed and reattach the copper braid lead to each counterweight.

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28. Using the non-abrasive side of #400 sand paper polish the two pins that lock the counterweight links to bracket (reference 13). Re-install the pins and lock in place with new locking wire (GRS drawing number 55376). Wire should fit into reduced diameter section of pins and pin should fit flushed with back surface of bracket.

29. Using air purge rear outside bracket (reference 7) of any foreign material and then re-install over counterweights using eight nuts.

30. Using air purge the front knife edge bearing (reference 4) of any foreign material. Polish knife edge using non-abrasive side of #400 sand paper. Inspect bearing surface under at least seven times (7X) magnificaion to insure knife edge is not damaged. If there is any damage bearing must be replaced.

31. Inspect the area of approximately 1/8 inch diameter in the center of bearing cap (reference 3) that ball (reference 5) touches. This area must be free of any score marks. If any score marks are observed they must be removed by polishing. To polish use #400 sand paper. After polishing, air should be used to remove any foreign material. If score marks cannot be removed bearing cap must be replaced.

32. Lubricate knife edge of bearing (reference 4) and ball (reference 5) as described in step 14.

33. Install front bearing (reference 4), bearing cap (reference 3), ball (reference 5) and shims (reference 6) using two new screws (reference 2). These screws after being tightened should be locked in place by displacing material of the edge of the screw head into the depression in the bearing cap.

34. Repeat steps 30 through 33 for the rear bearing assembly. This completes the re-assembly of the operating mechanism.

B. Mechanical Adjustments:

1. Apply normal operating current to mechanism as per appropriate page of ED 28718 (copy attached). Match up mechanism drawing number and serial number (if applicable) with the listings on ED 28718 to obtain specific electrical operating values. Adjust and lock stop screw (reference 6) so outside color disc centers on aperature of adjusting fixture. Also adjust stop screw (reference 17) to just strike stop on bracket (reference 13) and then back off 1/4 turn and lock in place. These adjustments must be made for left and right color discs. Overtravel of spectacle, in energized position, must be not less than 1/64 inch measured on an arc through the center of the color discs. From the energized to the de-energized position of the spectacle the front contacts must not make after initial break and back contacts must not break after initial make.

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2. Adjust and lock lower stop screw to center the red color disc. In this position the stops should just touch the counterweights. Check for proper adjustment by applying approximately one half normal operating current to the mechanism through a pole changer switch. Movement of spectacle should be less than 1/32 inch as mechanism is pole changed.

3. Adjust compression of right hand contact springs as follows: Rotate spectacle to the left, when right hand color disc slightly overlaps aperature in mechanism case (or adjusting fixture) the back contact must just be breaking. When the center color disc still has a slight overlap on the aperature the front contact shall just make. In both adjustments the overlap shall be:

   Minimum - Color of disc just perceptible through aperature.

   Maximum - Color perceptible from edge measured across diameter of disc):

   1/32 inch for front contact just making
   1/8 inch for back contact just breaking

   Adjust compression of left hand contacts in the same way by rotating spectacle to the right.

4. With mechanism in de-engerized position bend back contact finger until it touches both parts of moveable back silver contact. At same time adjust contacts to make with the stationary back contact button. Contact pressure must be 1 1/8 ounce minimum. This adjustment should be made to both right and left side contacts.

5. Contact resistance, measured with 1 ampere through circuit shall be:

   0.180 Ohm maximum for fronts (carbon to metal)
   0.030 Ohm maximum for backs (metal to metal)

6. Install mechanism into die cast case. Four mounting screw must be securely tightened.

C. Electrical Tests

1. Test mechanism using appropriate page of ED 28718.

2. After electrical parameters are met, using air purge clear cover of any foreign material and install.

3. Recheck electrical values with cover in place.

This completes cleaning and adjustment procedure.

GENERAL RAILWAY SIGNAL
A UNIT OF GENERAL SIGNAL
ROCHESTER NEW YORK 14602-0600

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PARTS LIST

Reference	Description	Drawing Number
A.	Armature Complete (Includes coil assembly but not color discs)	53055-11 Gr. 1
1.	Spectacle (part of armature complete - not available as separate part)	
2.	Screw	53829-2
3.	Bearing Cap	53828
4.	Bearing	53828-1
5.	Ball	36126-4
6	Shim (.005 thick)	53879
6A.	Shim (.003 thick)	53879-1
7.	Bracket	53063-10
8.	Counterweight Link (not available as separate part)	
9.	Bracket	53063-11
10.	Bracket	53064-7
13.	Bracket (not available as separate part)	
14.	Wheel (not available as separate part)	
15.	Shaft (not available as separate part)	
16.	Screw (5/18 inch headless)	5100-10
17.	Screw (7/8 inch headless)	5100-6
18.	Post (For counterweight)	2644-5
--	Wire (to lock counterweight links)	55376

Form 936-1

GENERAL RAILWAY SIGNAL
A UNIT OF GENERAL SIGNAL
ROCHESTER NEW YORK 14602-0600

EI 2400

SHEET 7

9-14-87

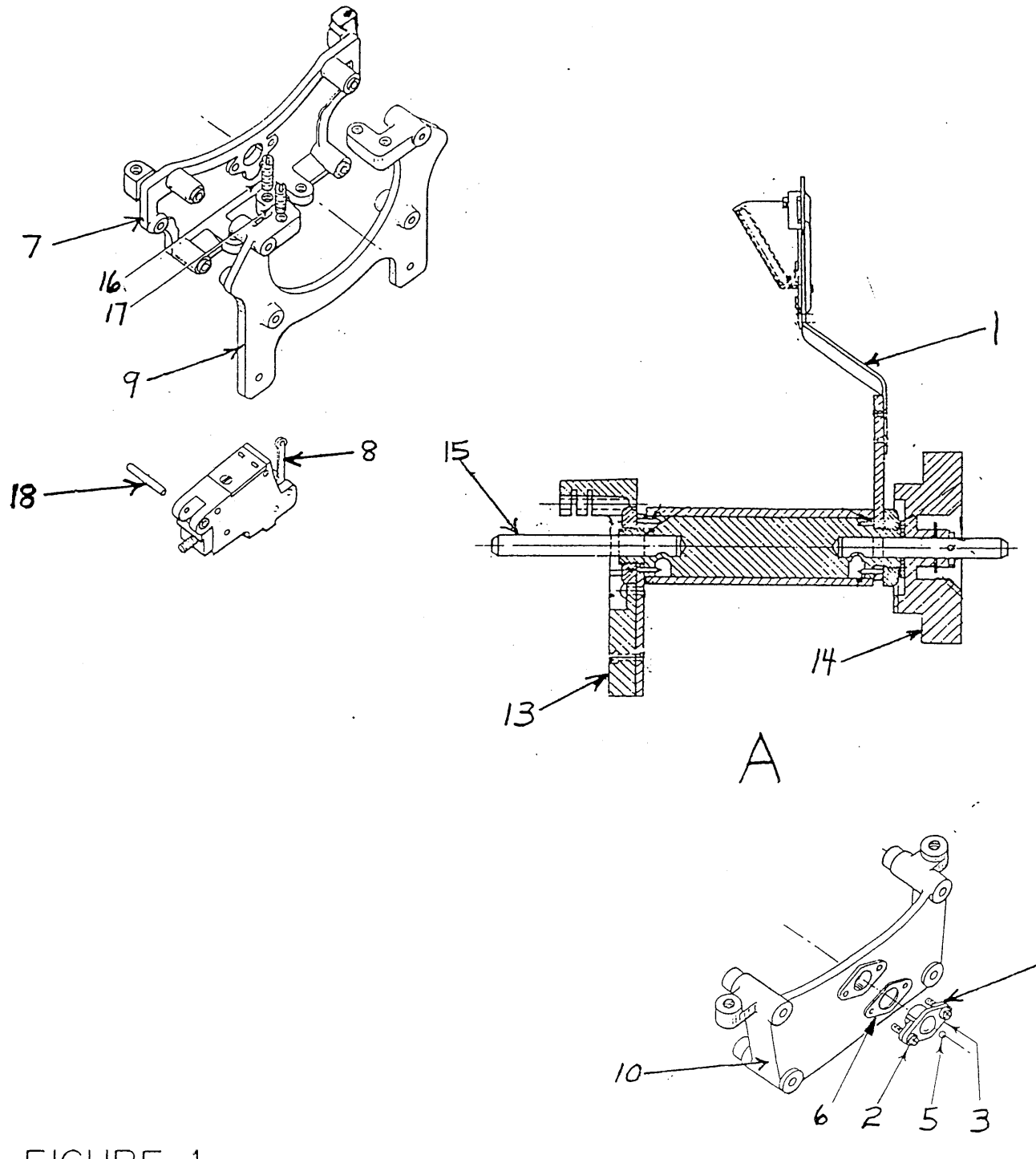


FIGURE 1

FORM 936

GENERAL RAILWAY SIGNAL COMPANY
ROCHESTER 2, N.Y.

CUSTOMER GUIDE FOR FOCUSING LAMP IN SA SIGNAL REFLECTOR HOLDER

ED 70-1

The purpose of this specification is to outline a method for obtaining a satisfactory beam candlepower output from a Type SA Signal in which the factory calibration has been disturbed.

To obtain the maximum beam candlepower output of such a unit it is important that the lamp bulb be located with its filament at the focal point of the ellipsoidal reflector.

PROCEDURE:

1. Provide a white with flat finish screen located 25 feet from a pedestal on which the the unit being tested is mounted. A small sighting hole (approximately 3/8" in diameter) is required in the screen, in alignment with the sighting device on the signal.

2. Light a lamp placed in back of the small sighting hole on the screen.

3. Place the signal under test on the pedestal and point it at the screen.

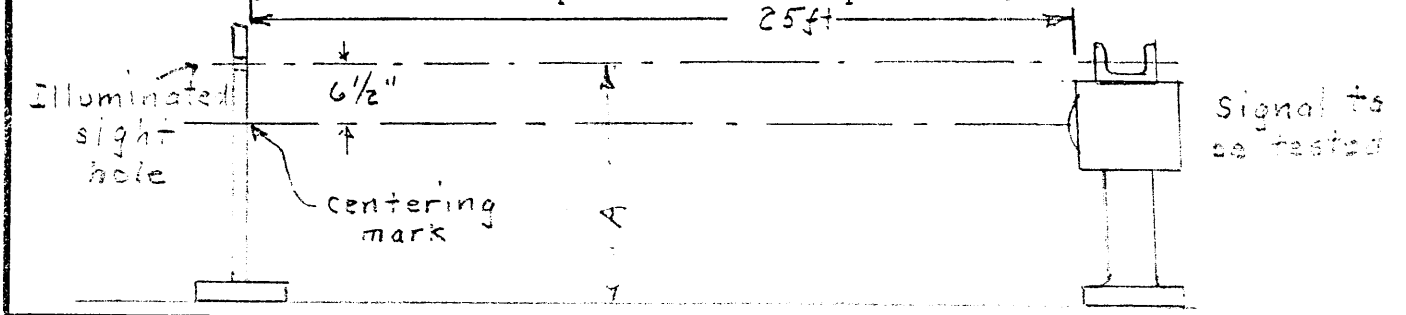
4. Align the unit so that the cross hairs in the sighting device center on the illuminated hole on the screen securely lock in this position.

5. Remove reflector holder and insert lamp in receptacle with lamp pins fully seated.

6. Replace holder in mechanism case. Test to make sure that the spring clips hold the reflector holder securely to mechanism.

7. Apply nominal service volts to the lamp.

8. With the mechanism showing red indication, adjust the lamp receptacle adjusting nuts until the beam on the screen will be as small in outline and as uniform in intensity as possible, and so that the beam centers on a centering mark on the screen. Lock the receptacle in this position.



DATE	8-7-68	REV		REV		REV		REV		REV		REV		REV		REV	
R. NO.		A															
CH'K'D	EHB 8/7																
APP'D	JCL 8/7																